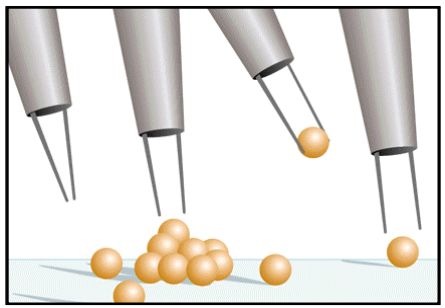
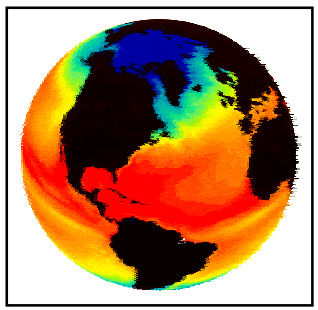
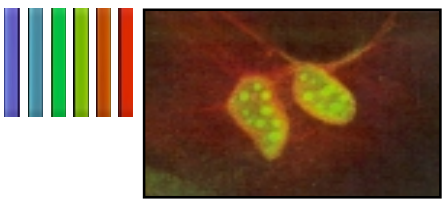
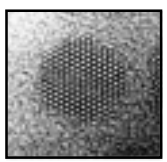
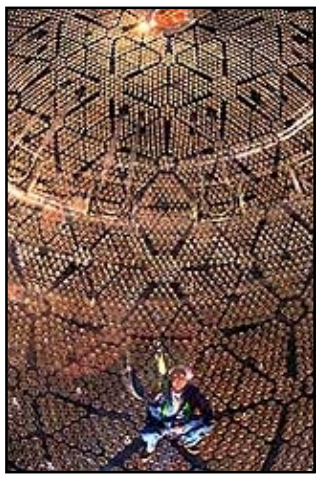
Strength Through Science











The FY 2001 Office of Science Budget Request

Science for America's Future

Office of Science FY 2001 Budget

- Provides significant growth for DOE Science programs in areas of strength and excellence
- Emphasizes new opportunities in the physical and life sciences and the interdependence between them
- Emphasizes new approaches in advanced scientific computing
- Delivers new capabilities and increased utilization for SC scientific user facilities
- Continues construction of the Spallation Neutron Source and the Large Hadron Collider

Office of Science
Results & Recognition

Breakthrough of the Year:
First Runner-Up:
Genomics Speeds Ahead. In December 1998, the publication of the first genome of a multicellular organism, the nematode *Caenorhabditis elegans*, ushered in a new era in genomics--that of rapidly comparing thousands of genes in complex organisms. This year every facet of genomic technology accelerated, from sequencing to database management. As a result, genomics swept through biology, as researchers compared the sequences as well as the expression patterns of many thousand genes at once.

Runners Up:

Rally for ribosomes: After a prolonged drum roll, t curtain came up this year on the structure of one of the cell's mos important players, the ribosome. This massive protein-RNA com produces proteins, somehow accurately translating genomic information into each of the tens of thousands of molecules nece for life. Structural biologists had struggled for decades to probe complex molecular machine but were thwarted until recently by intricate tangle of 54 proteins and three RNA strands

Flat and happy: Cosmologists can hardly luck has changed. New observations often send theo back to their equations, but this year, measurements cosmos's most basic numbers gave the answer theori The universe appears to contain just the amount of that the most elegant picture of its origins requires

Smithsonian *21st Century Pioneer Award* Goes to Human Genome Program Leaders

DOE Science Dominates Supercomputing Awards

At SuperComputing '98, sponsored by the annua conference on high performance networking and computing, those who have pushed the envelope constantly stretching discipline were honored by for their contributions. SC98 is sponsored by Inte Electrical & Electronics Engineers Computer So Association for Computing Machinery.

Teams supported by the Office of Science receiv majority of the awards -- including both 1998 Go Bell Prizes, the 1998 Fernbach Award, and sever

Science The New York Times June 22, 1999

Physicists Zero In on Ghostly Neutrinos

By MALCOLM W. BROWNE

Scientists operating huge underground detectors in Japan and Canada are racing to obtain independent proofs that the elusive neutrino, a ghostly particle whose vast family may constitute a large part of the mass of the universe, changes form as it flies through matter or space.

At least some neutrinos are now believed to have some mass, and physicists would love to learn how much, a goal that may be reached by studying the changes in form a traveling neutrino undergoes.

At issue is the effect of neutrinos, which pervade every cubic inch of the universe, on the rate at which the universe expands.

October 4, 1999 Associated Press

Asthma-linked Genes Identified

Researchers at the U.S. Department of Energy's Lawrence Berkeley National Laboratory (LBNL) have announced the discovery of two genes that contribute to the development of asthma.

More than 14 million people in the United States suffer from asthma and other chronic respiratory ailments. The number of victims has doubled

NATIONAL Science June 8, 1999 The New York Times ON THE WEB

Systems Designed to Hold a Homemade Sun

By MALCOLM W. BROWNE

Scientists have developed a variety of devices and systems in which they hope to be able to compress hydrogen to the densities and temperatures needed to sustain thermonuclear fusion reactions. These are among them.

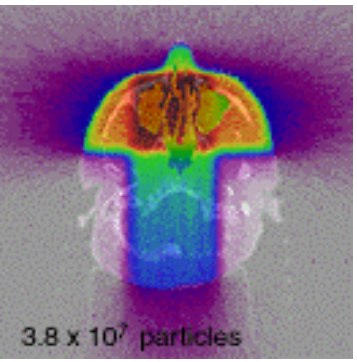
Tokamaks, reactors that are shaped like doughnuts and occupy large buildings, are chambers from which air has been removed and into which is injected a diffuse plasma of hydrogen isotopes, especially mixtures of deuterium and tritium. The plasma, a hot, electrically charged gas, is compressed within the doughnut by two sets of

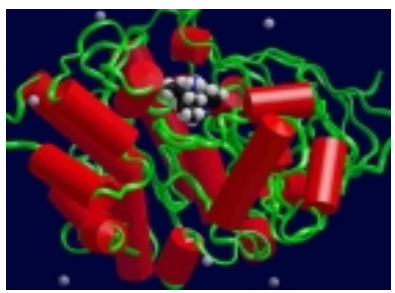
The computer-generated shapes on the cover are the unique antenna patterns created when light is scattered from an electron that undergoes a figure-of-eight orbit in the combined electronic and magnetic fields of a strong laser focus. Although predicted theoretically many decades ago, this phenomenon, a result of relativistic or nonlinear Thomson scattering, has only now been observed experimentally. Classical Thomson scattering is the scattering of low-intensity light by electrons, a process that leaves the frequency of radiation unchanged. In the relativistic variant, photons are radiated at various harmonics of the incident light frequency.

DOE Labs Win the Most R&D 100 Awards

R&D 100 AWARDS

1999





- DOE funded 43 of the 1999 R&D 100 Awards
  - *DOE has won 529 R&D 100 Awards*
  - *DOE is the largest single winner both in '99 and historically*
  - *SC research won 11 of 43 awards this year including those pictured*

Department of Energy Science

Top Five Government Research Organizations for*:

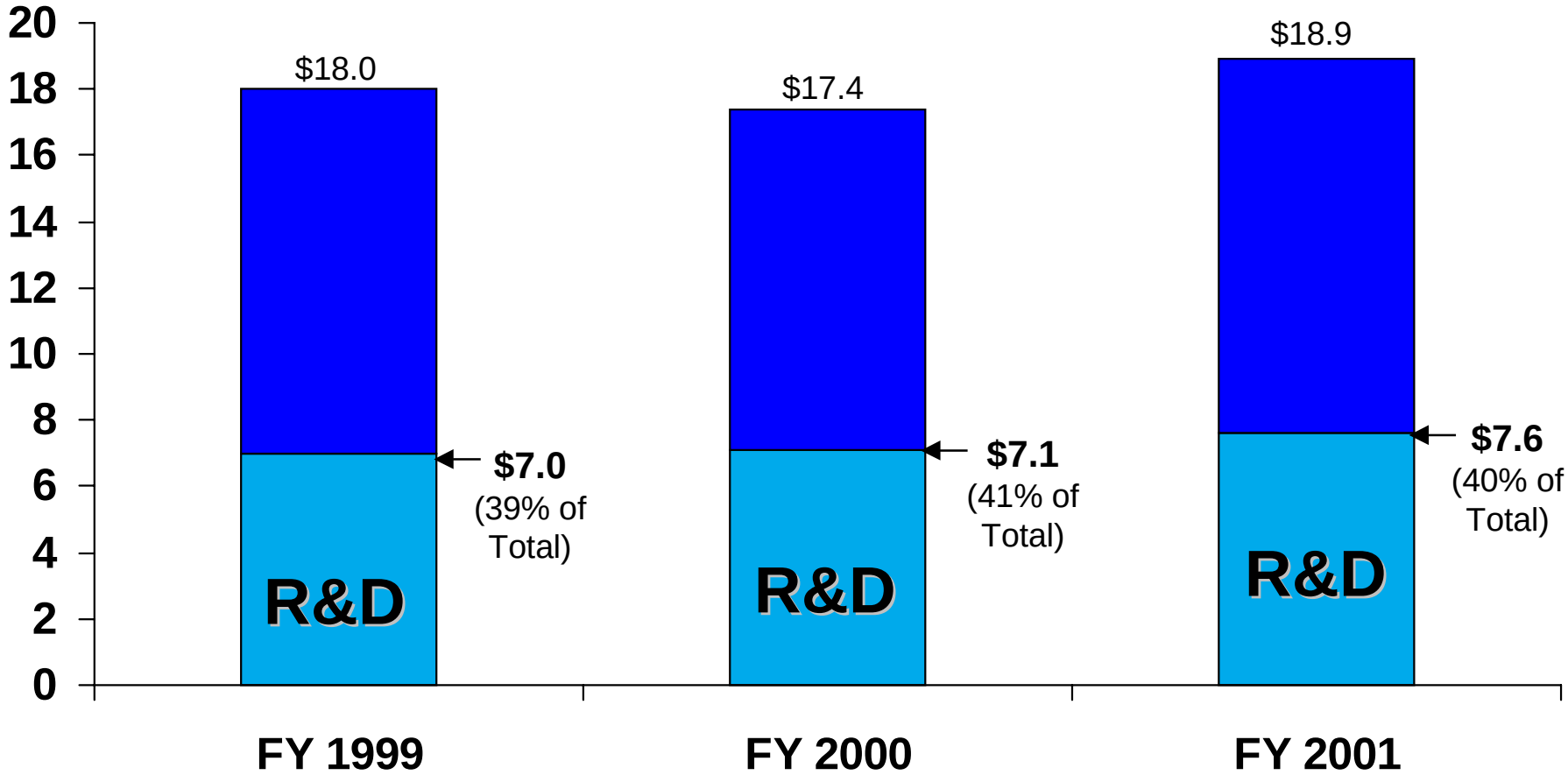
Physical Sciences	Environmental Sciences	Mathematics & Computing	Engineering	R&D Facilities**
1. Energy (2,012)	1. NASA (1,051)	1. DOD (657)	1. NASA (1,948)	1. Energy (939)
2. NASA (1,019)	2. NSF (481)	2. Energy (623)	2. DOD (1,837)	2. NASA (403)
3. NSF (515)	3. DOD (383)	3. NSF (399)	3. Energy (851)	3. DOD (386)
4. DOD (412)	4. INTERIOR (364)	4. HHS (127)	4. NSF (484)	4. NSF (271)
5. HHS (205)	5. Energy (335)	5. COMMERCE (89)	5. TRANS (323)	5. HHS (227)

** Numbers are FY 1999 Dollars in Millions - Source: NSF*

*** Numbers are FY 1999 Dollars in Millions - Source: OMB*

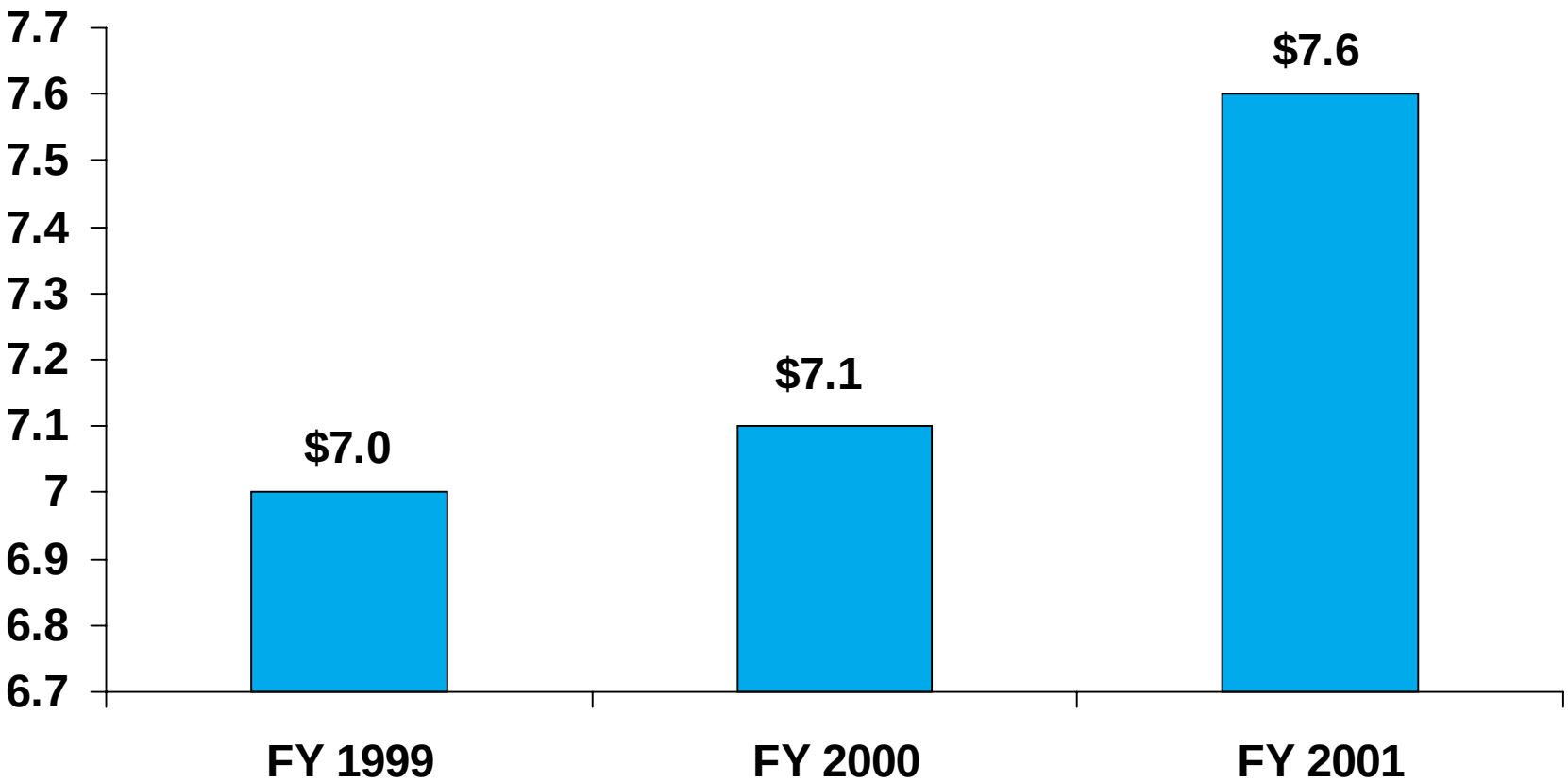
U.S. Department of Energy
FY 2001 President's Budget Request

Total DOE Discretionary Appropriation
(B / A in Billions)



U.S. Department of Energy
FY 2000 President's Budget Request

Total DOE Research and Development
(B / A in Billions)



U.S. Department of Energy
FY 2001 Congressional Budget Request
(Dollars in Millions)
Office of Science

Program	*FY 2000 Approp.*	*FY 2001 Request*	*Change*
Basic Energy Sciences	$ 771.6	$ 1,015.8	$+244.2 (32%)
Biological & Environmental Res.	432.9	445.3	+12.4 (3%)
Fusion Energy Science	244.7	247.3	+2.6 (1%)
Advanced Scientific Comp. Res.	127.9	182.0	+54.1 (42%)
High Energy Physics	697.7	714.7	+17.0 (2%)
Nuclear Physics	347.7	369.9	+22.2 (6%)
MELFS and ERA	34.0	34.9	+0.9 (3%)
Science Program Direction	131.1	141.2	+10.1 (8%)
Total	**$2,787.6**	**$3,151.1**	$+363.5 (13%)
Technical Information Management	8.6	9.3	+0.7 (8%)

- Nanoscale Science, Engineering, and Technology ($84M, +36M)
- High-Performance Computing for Science in the 21st Century -- Enhanced Capabilities ($190M, +70M)
- Life Sciences -- Understanding the Microbial Cell ($12M, +12M) and Biomedical Engineering ($7M, +5M)
- Human ($90M, +1M) & Microbial Genomes ($22M, +8M)
- Global Climate Research ($123M, +3M)
- Carbon Management Science ($36M, +4M)
- Robotics & Intelligent Machines ($3M, +2M)
- Spallation Neutron Source ($281M, +163M)
- Scientific User Facilities Upgrades & Increased Utilization ($1,207M, +65M)
- Large Hadron Collider ($70M, +0)

Numbers in parentheses are FY01 request & increment from FY00 appropriation

U.S. Department of Energy
FY 2001 Congressional Budget Request
(Dollars in Millions)
Office of Science

Program	***FY 2000 Comparable Appropriation***	***FY 2001 Request***	***Change***
Basic Energy Sciences	$ 779.4	$ 1,015.8	$ +236.4
Biological and Environmental Research	434.1	445.3	+11.2
Fusion Energy Science	247.8	247.3	-0.5
Computational and Technology Research	127.9	182.0	+54.1
High Energy Physics	703.8	714.7	+10.9
Nuclear Physics	355.8	369.9	+14.1
Multiprogram Energy Labs-Facilities Support and Energy Research Analyses	34.1	34.9	+0.8
Science Program Direction	131.7	141.2	+9.5
Total	**$2,814.6**	**$3,151.1**	**$+336.5**
Technical Information Management	8.6	9.3	+0.7

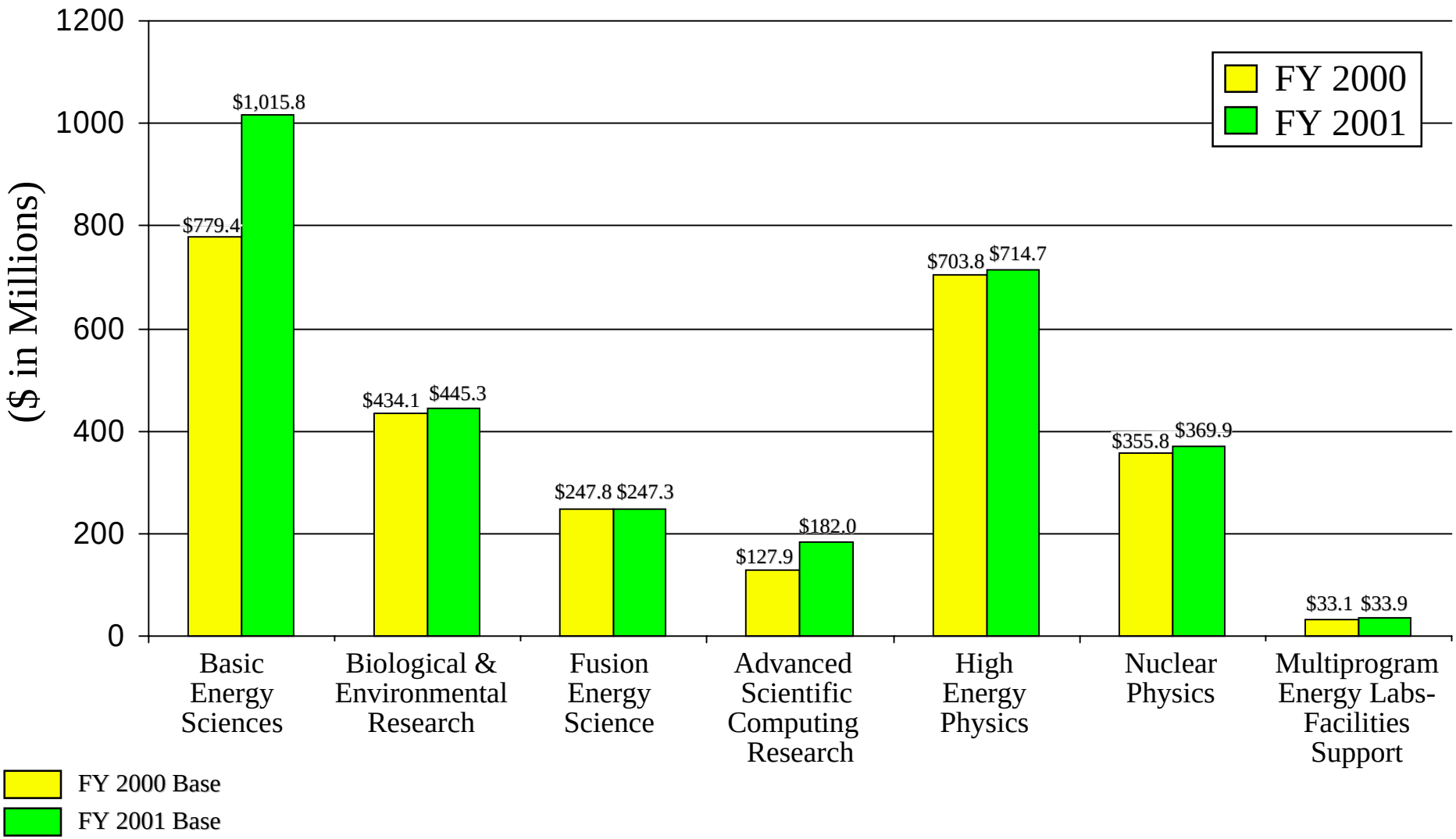
Key Results Supported by FY 2001 Budget

- Increase nanoscale science, engineering and technology research to understand how deliberate tailoring of materials can lead to new and enhanced functionality and to provide new experimental tools and computational modeling tools for nanoscale research.
- Increase support for advanced scientific computing efforts, including computational modeling and simulation in broad areas of fundamental science.
- Increase support for life sciences activities including (1) research to understand the complete workings of the microbial cell for applications in energy use and production, bioremediation, and carbon sequestration, and (2) research in biomedical engineering to develop new materials, processes, implants, devices, and informatic approaches.
- Continue human and microbial genome research.
- Continue global climate change research.
- Increase Climate Change Technology research, a program addressing carbon management in areas of science for efficient technologies, fundamental science underpinning advances in low/no-carbon energy sources, and sequestration science.
- Expand fundamental research in robotics and intelligent machines for future applications important to DOE missions and to enable remote access to the DOE Office of Science user facilities.
- Continue construction of the $1.4 billion Spallation Neutron Source at Oak Ridge National Laboratory to regain the U.S. position of international leadership in neutron scattering for the physical, chemical, materials, polymer, and biological sciences.
- Increase support for scientific user facilities by providing funds to optimize operating time and user support to serve more than 15,000 scientists inacademia, industry, and federal laboratories who use these facilities annually.
- Continue participation in the Large Hadron Collider, the foremost High Energy Physics facility of the next decade.
- Implement the initiative in workforce recruitment and retention in order to sustain a talented and diverse R&D technical workforce.

United States Department of Energy

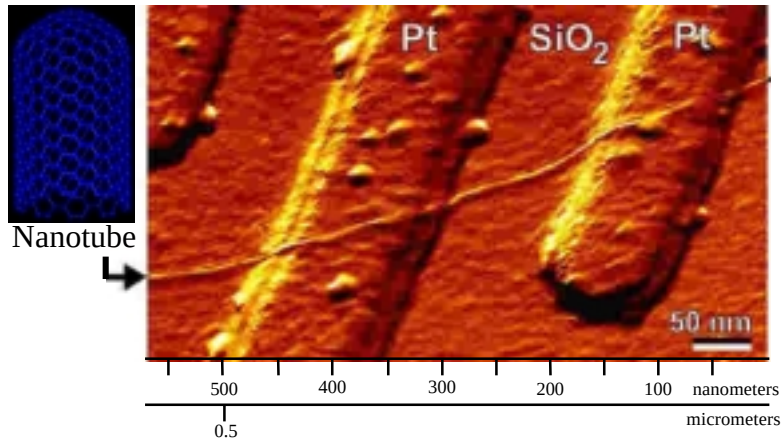
Office of Science

FY 2001 Congressional Budget Request

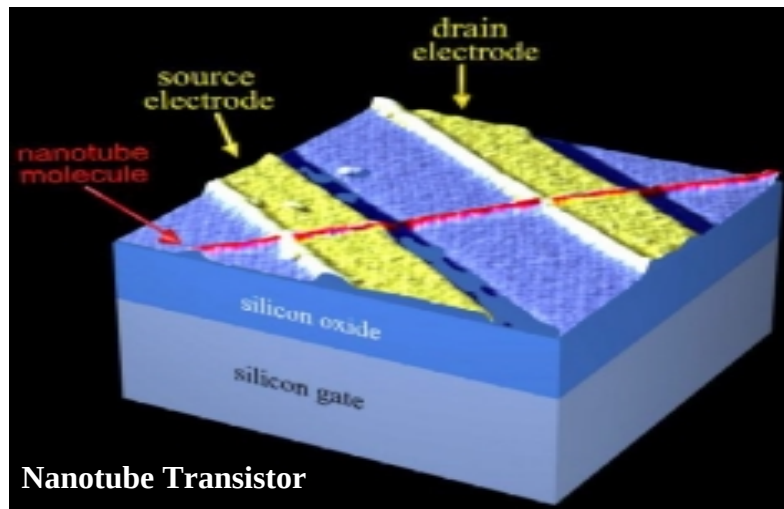


Nanoscale Science, Engineering, and Technology
Building Structures One Atom at a Time

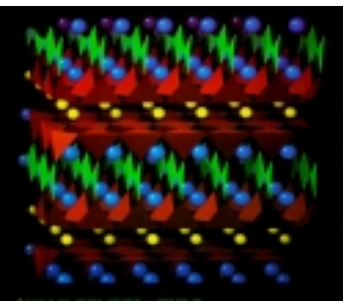
- Tailor materials at the nanoscale for desired structure/function properties
  - *Materials with enhanced physical, mechanical, optical, electrical, tribological, or catalytic properties*
  - *Materials with the ability to self assemble, self repair, sense and respond to the environment*
- Long-term, high-risk, interagency activity -- a unique instance of common scientific and technological frontiers
- Combines expertise in materials sciences, chemistry, physics, biology, engineering, and computation
- Expected are technological developments to rival the impact of the transistor



Nanotubes exhibit unique quantum-wire properties which derive from their nanometer diameter and the special electronic structure of graphite. Nanotube transistors have recently been fabricated. These three-terminal devices consist of an individual semiconducting nanotube on two metal nanoelectrodes with the substrate as a gate electrode.



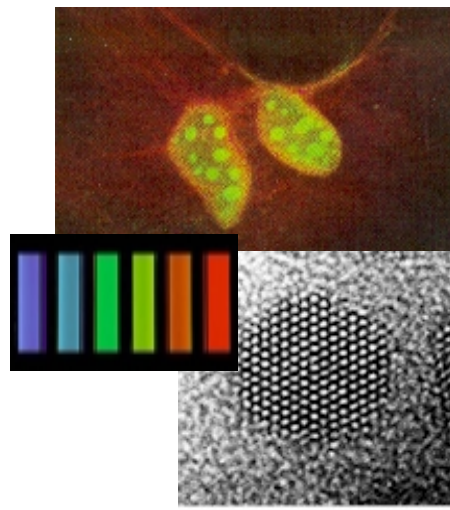
Nanoscale Science, Engineering, and Technology
The Challenges

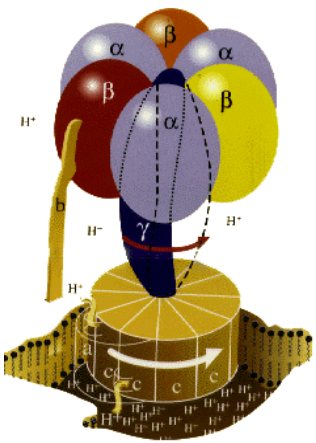


Superconductivity, a collective effect, enables materials to conduct electricity without loss.

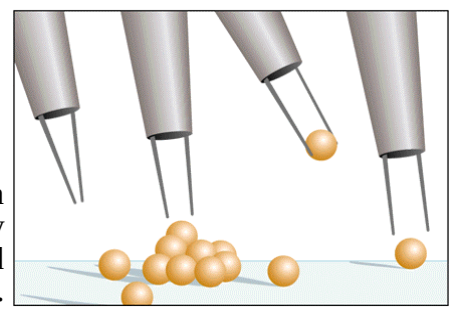
- Attain a fundamental understanding of nanoscale phenomena, particularly collective phenomena
- Design and synthesize materials at the atomic level to produce materials with desired properties and functions
- Understand the processes by which living organisms create materials and functional complexes to serve as a guide and benchmark for synthesis
- Create experimental tools and theory/modeling/simulation tools to drive the nanoscale revolution

Cadmium selenide nanocrystals linked to biomolecules light up a cell's actin filaments (red) and nucleus (green).



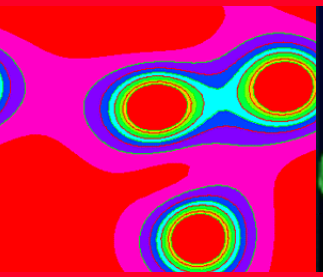


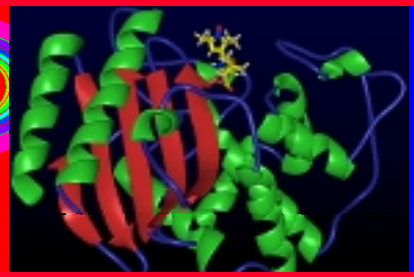
Enzymatic mechanism of ATP synthesis, a molecular rotator that can be incorporated into manmade structures

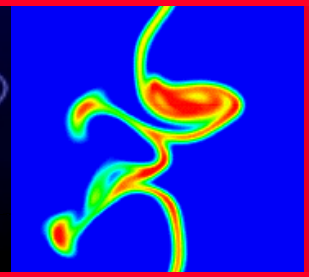


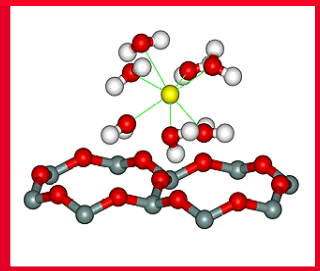
Tweezers composed of carbon nanotubes grab a particle only about 500 nm in diameter and move it to a desired location.

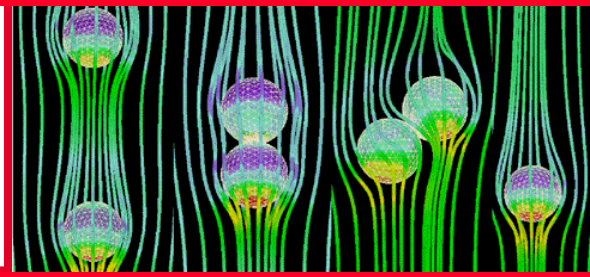
Dramatic Increases in High-Performance Computing Required for 21st Century Scientific Leadership

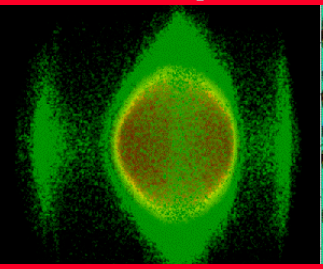

Vortices in a superfluid

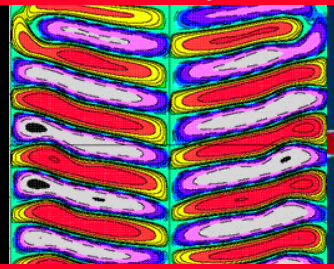

Protein dynamics


Turbulent methane flame

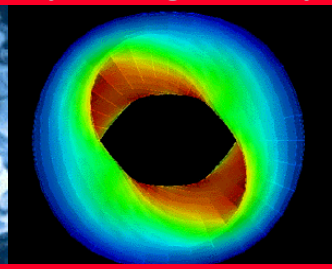

Clay-mineral geochemistry

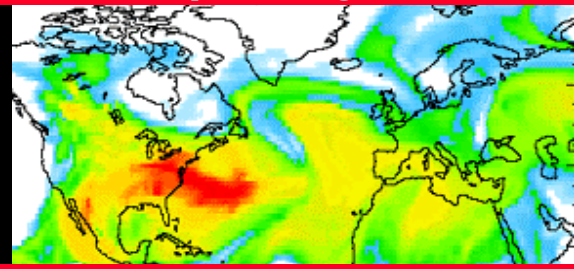

Two spheres mixing in a stream

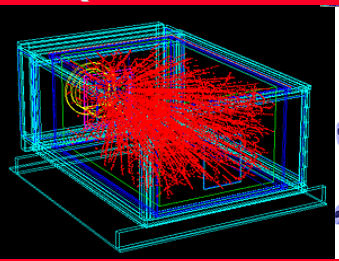

HEP particle beam halo

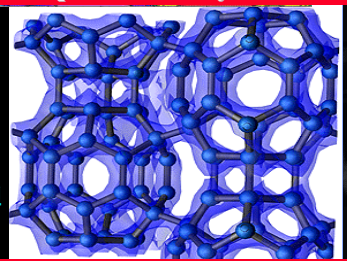

Transport barrier dynamics

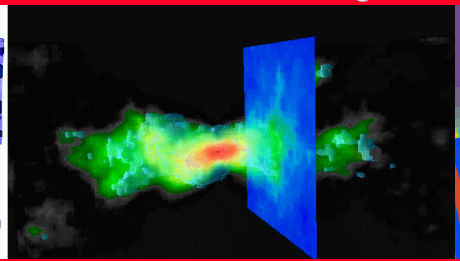

Combustion turbulence modeling

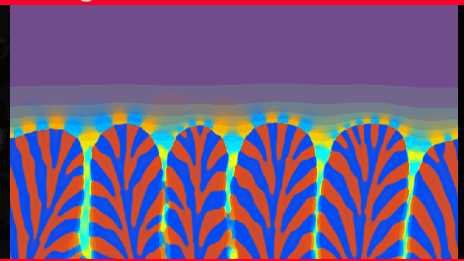

Fusion magnetic field

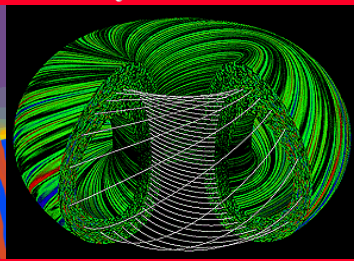

Perturbation in clear-sky and cloud albedo

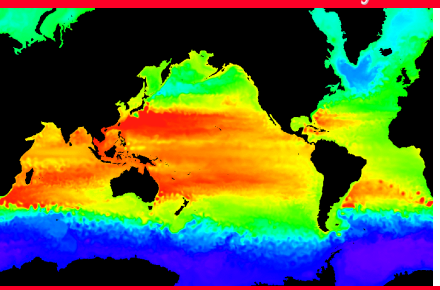

Au-Au collision

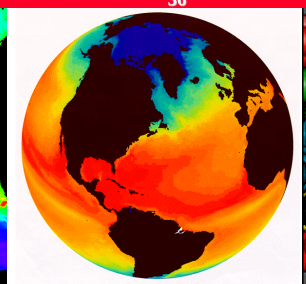

Crystal structure for C_{36} solid

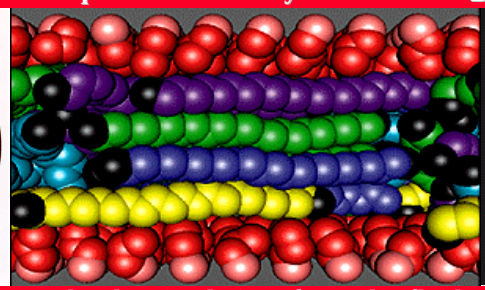

Lattice quantum chromodynamics

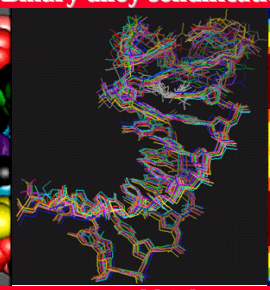

Binary alloy solidification

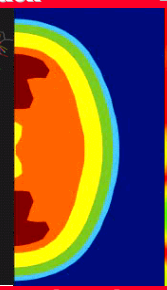

Perturbed plasma density

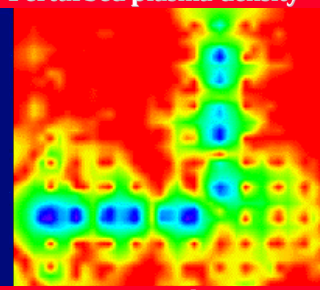

DOE Parallel Climate Model


Sea surface temperature


Molecular simulation of complex fluids


Structural biology


Nuclear theory


Waveguide optics

Taking the Next Steps

Advanced Computational Modeling & Simulation

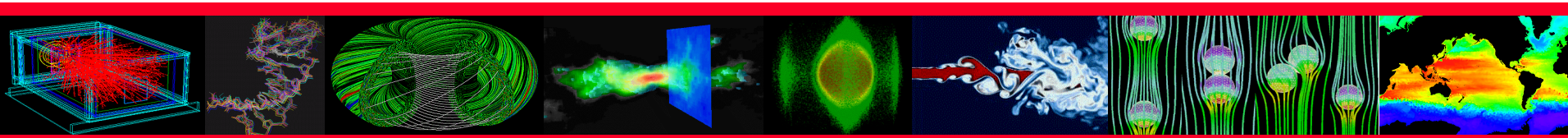
Today's supercomputers are one teraflop machines with about 1,000 individual processors. Today's PCs store about 1 gigabyte of data, a petabyte is one million gigabytes.

Tomorrow's computers will be:

- **Fast** ***(100 teraflops)***
- **Big** ***(10,000 individual processors)***
- **Difficult to program** ***(Requires a team approach)***
- **Massive data producers** ***(Petabytes to view, move, and store)***

This requires:

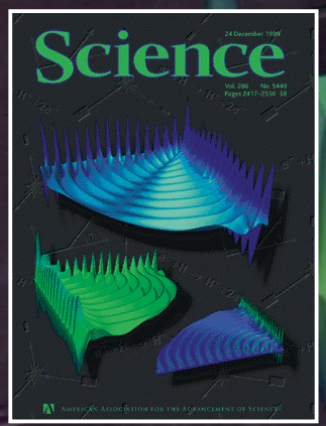
- A new generation of modeling and simulation software
- Tools to make terascale computers useful for real-world problems
- A computing and network infrastructure - to provide terascale computer resources to the scientists that need them



Advanced Scientific Computing Research (ASCR) Enables Scientific Computing in SC Programs

ASCR:

- ***Develops mathematical, computing, networking, and visualization tools***
- ***Develops and pilots national collaboratories***
- ***Partners with SC Programs to promote and support computing for fundamental science***

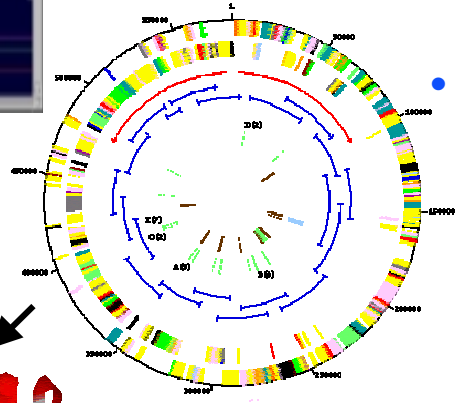


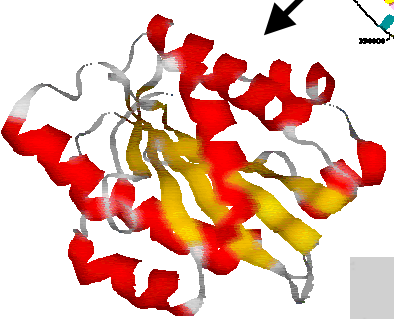
Wave functions for the breakup of a system of three charged particles.

ASCR's accomplishments have revolutionized large scale computing:

- **Developed national computing and networking facilities**
- **Provided the first interactive access to supercomputers**
- **Defined video teleconferencing standards**
- **Developed the most widely used parallel computing software and numerical libraries in the world**
- **Developed the slow start algorithm for the Transmission Control Protocol (TCP) part of TCP/IP (Internet Protocol), which enabled the Internet to scale from a small research network to today's worldwide infrastructure**
- **Implemented ESnet asynchronous transfer mode (ATM), acknowledged by Sprint as accelerating ATM for Internet-wide networking by 5-10 years**
- **Developed the high performance network interface (HiPPI), now the industry standard for computers and peripherals interconnects**

Understanding the Microbial Cell

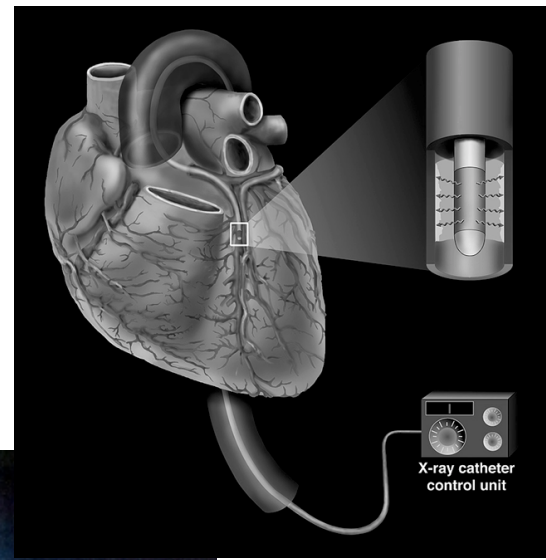




- **Goal: To understand the complete workings of a microbial cell and to use this information to address DOE needs in energy use and production, bioremediation, and carbon sequestration:**
- **Challenges:**
  - *Given the minimum set of genes necessary to sustain a simple free-living microbial cell, express the genes to produce the relevant proteins, and determine their structure.*
  - *Determine the physiologial and biochemical functions of the genes and specific bioprocesses using standard biochemical techniques and structural/computational biology.*
  - *Use high-end computing to model gene-gene, gene-protein, and protein-protein interactions as well as the internal biochemistry of the cell.*
  - *Use gene-protein manipulation to enhance or suppress various cell functions.*
  - *Focus on functions that are relevant to DOE goals, e.g., bioremediation, carbon sequestration, sustainable energy production.*

Biomedical Engineering

- **Goal: Foster research using DOE's unique resources in the biological, physical, chemical, engineering, and computing sciences to provide high-risk, engineered solutions to medical needs.**
  - *In FY2001, this activity will support innovative programs including nanomedicine, biomaterials, spectroscopy, and molecular biology to provide the scientific foundation for the development of engineered human tissue, sensitive devices for disease detection, and artificial organs and limbs.*
  - *Member of the Bioengineering Consortium (BECON), a federal working group on biomedical engineering that includes the NIH institutes and NSF. BECON coordinates and fosters new basic understandings, collaborations and transdisciplinary training in bioengineering among the participating agencies.*
  - *Will be coordinated with BECON activities and will utilize the BECON expertise to validate the medical relevance of cutting-edge technological advances In the national labs involving, e.g., biologics, materials, processes, implants, devices, and information systems.*



Tools to prevent blockages from reoccuring following angioplasty

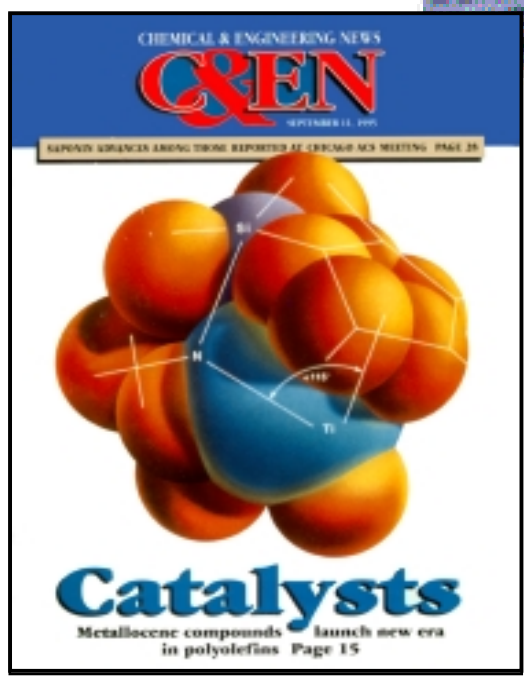
Biomaterials for artificial joints

Carbon Management Science

Climate Change Technology Research

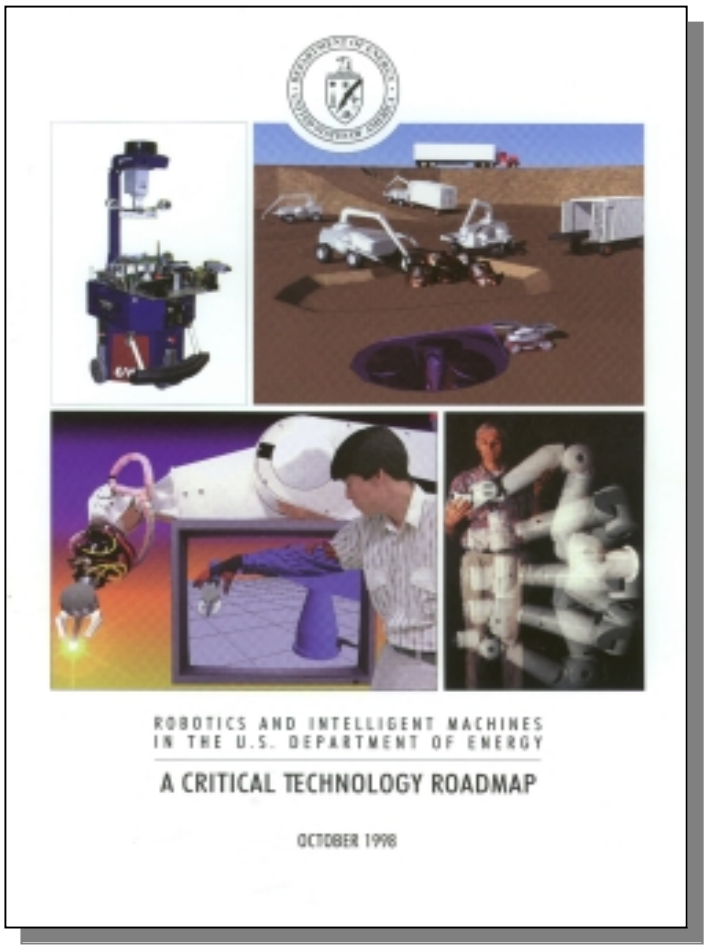
- $36 Million in the Office of Science in FY2001
  - *$16 M in Biological & Environmental Research*
    - soils and vegetation, oceans, advanced biological sequestration research
  - *$20 M in Basic Energy Sciences*
    - 52 new projects have been started at national laboratories and universities related to increased energy efficiency and to carbon sequestration in geological formations
- Emphasizes carbon sequestration science; science for efficient technologies; and science to advance low- and no-carbon energy sources
- Coordinated with Offices of Fossil Energy and Energy Efficiency & Renewable Energy

Two new sites for fundamental research on carbon sequestration in the terrestrial ecosystem and in the ocean



Catalysts, such as this metallocene compound, increase efficiency and reduce pollution

Robotics and Intelligent Machines

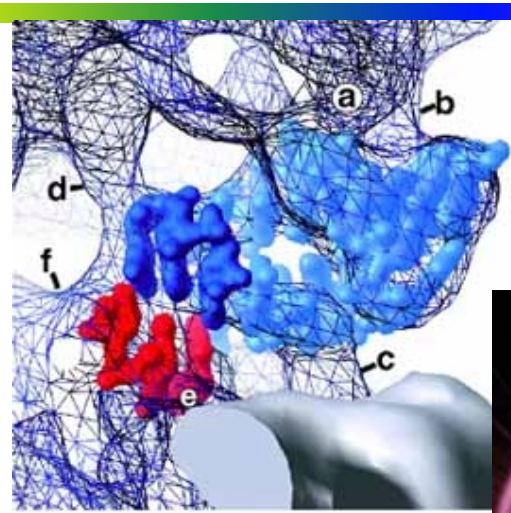


- University-based research effort focussing on sensors and sensor integration, remote operation, data acquisition, and controls.
- Topics address DOE mission areas including remote access to user facilities.
- Activities follow the Robotics and Intelligent Machines Roadmap
  - *completed in 1998*
  - *participation from*
    - DP, EE, EH, EM, SC, FE, MD, NE and NN
    - representatives of national laboratories
    - representatives from NSF and DARPA
- Part of a coordinated DOE-wide activity

Scientific Facilities Utilization

Full Productivity of the DOE S&T Infrastructure

- Presidential Initiative - FY 1996; Renewed commitment - FY 2001
- Used by over 15,000 scientists from universities, industry, and federal laboratories each year
- Facilities are critical to progress in the physical, chemical, engineering, biological, and life sciences
- $1.21 billion in FY 2001 *(up $65M from FY00)*
- Full upgrade of SSRL, joint with NIH
- Operations, beamline construction, infrastructure improvements for the facilities
  - *ALS, APS, NSLS, SSRL*
  - *HFIR, IPNS, LANSCE*
  - *EMSL, CRF II*
  - *B-Factory, Fermilab Main Injector*
  - *CEBAF, RHIC*



ALS image of overall ribosome - After decades of effort, techniques for crystallizing ribosomes and analyzing their structures have begun to yield rich dividends

High Energy Physics particle collision event simulation

The Advanced Photon Source - ANL

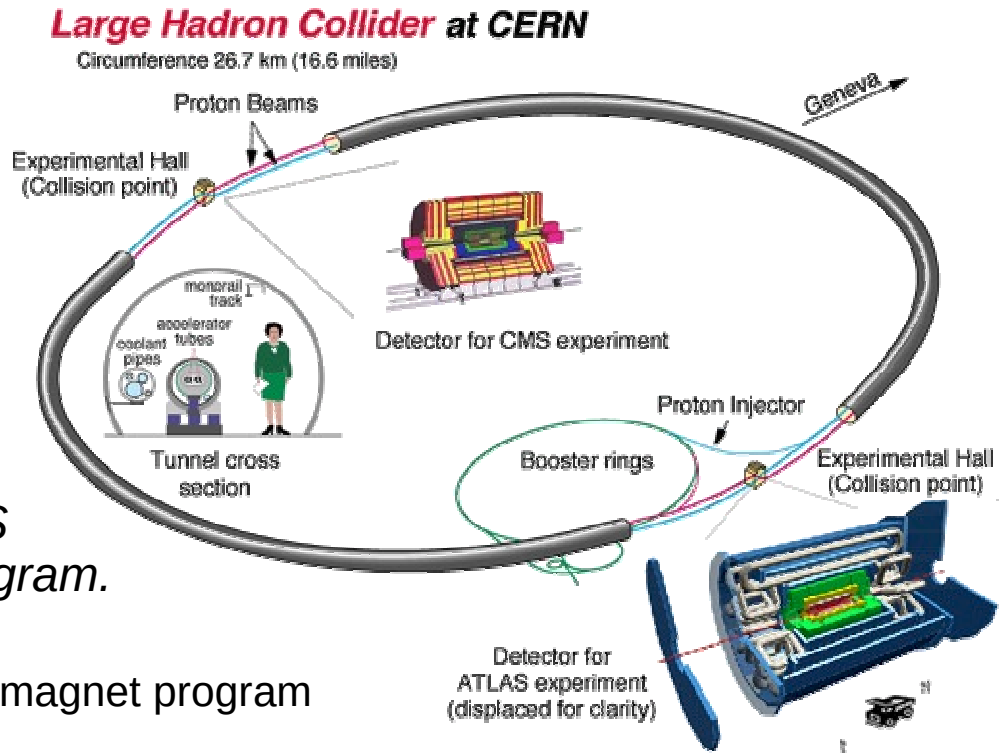
The Spallation Neutron Source (SNS)

Under Construction on Chestnut Ridge at ORNL

- World's premier neutron scattering facility for basic and applied research in physical, materials, polymer, chemical, and biological sciences
- Unwavering scientific community support; strong multilab commitment; bipartisan Congressional support
- New SNS Project Executive Director, top senior staff, and revised management systems in FY 1999
- FY 2001 activities - Begin Title II design, site preparation, subsystem fabrication, conventional facility construction
- FY 2001 requirement - $281 million
  Project completion - 2006

The Large Hadron Collider (LHC)

- LHC is the foremost high energy physics facility of the next decade and U.S. participation ensures access for U.S. scientists
- FY 2001 funding is $70M
- FY 2000 progress:
  - *DOE-NSF agreement in place for U.S participation in the LHC research program.*
  - *U.S. LHC Accelerator*
    - Interaction Region Quadrupoles model magnet program completed
    - Superconducting Cable Production measurement equipment delivered to CERN
  - *U.S. ATLAS Detector*
    - Fabrication work on the Liquid Argon Calorimeter - barrel cryostat progressing well
    - Production of the Tile Hadronic Calorimeter underway
  - *U.S. CMS Detector*
    - Hadron Calorimeter Design Reviews passed - absorber & scintillator production underway
    - Full-scale production underway on Endcap Muon cathode strip chamber - cathode panels



Experimental High Energy & Nuclear Physics
Facilities Poised to Make New Discoveries

- Fermilab Main Injector completed in FY99 on schedule and within budget. FY 2001 experiments will take advantage of new capabilities at the world's highest energy.
- SLAC B-factory full operation in FY 2000 on schedule and within budget. World record luminosity achieved; full luminosity and significant results on CP violation in B decays expected by summer 2000.

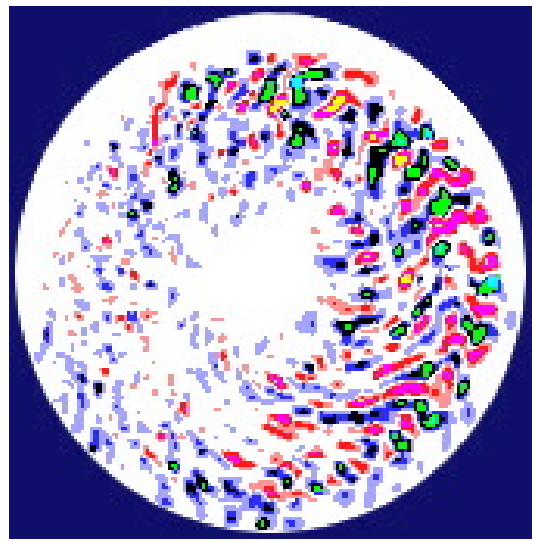
B-factory Dedication

Relativistic Heavy Ion Collider (RHIC) at BNL

- RHIC achieves full operation in FY 2001. Four detectors and 950 researchers have begun the search for a "quark-gluon plasma".
- CEBAF research program hits full stride. FY 2001 increases in beam energy and polarized beam intensities enable measurements with unprecedented sensitivities.

Science-Based Fusion Energy Research

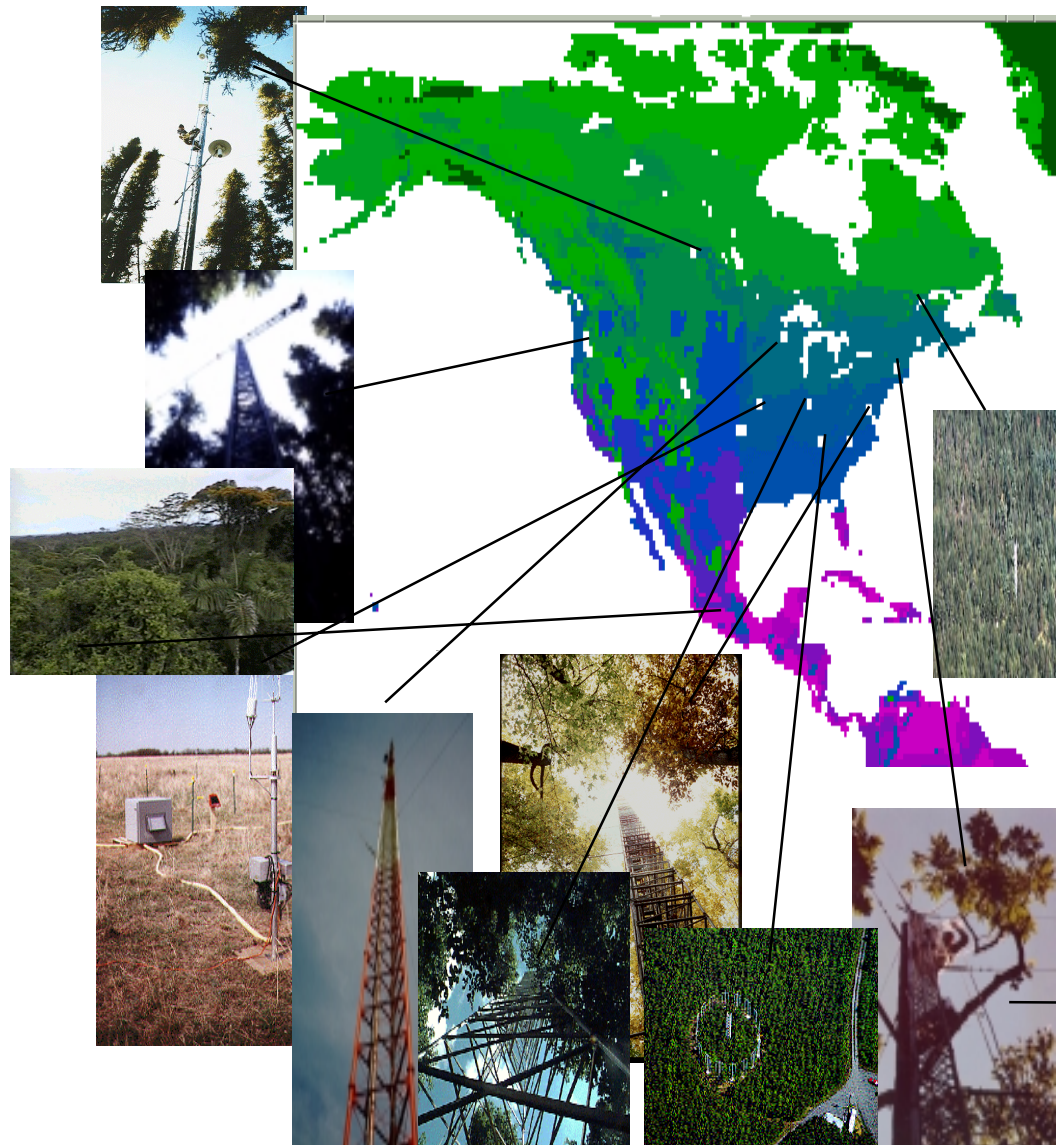
- Fusion is one of the most challenging scientific endeavors undertaken
  - *Drove the development of modern plasma science*
  - *Provided key applications of modern nonlinear physics*
  - *Plasma physicists leaders in emerging field - e.g. solitons, chaos, and stochasticity*
- Restructured Fusion program is responsive to the various reviews and reports
- Over one third of the 850 scientists in the U.S. fusion program plus 25 foreign participants met for 2 weeks this summer
  - *Broad support for technology research that supports both inertial and magnetic fusion*
  - *Broad support for burning plasma physics for magnetic fusion energy*



Advances in computational plasma physics have led to improved understanding of fusion experiments

U.S. Global Climate Research Program

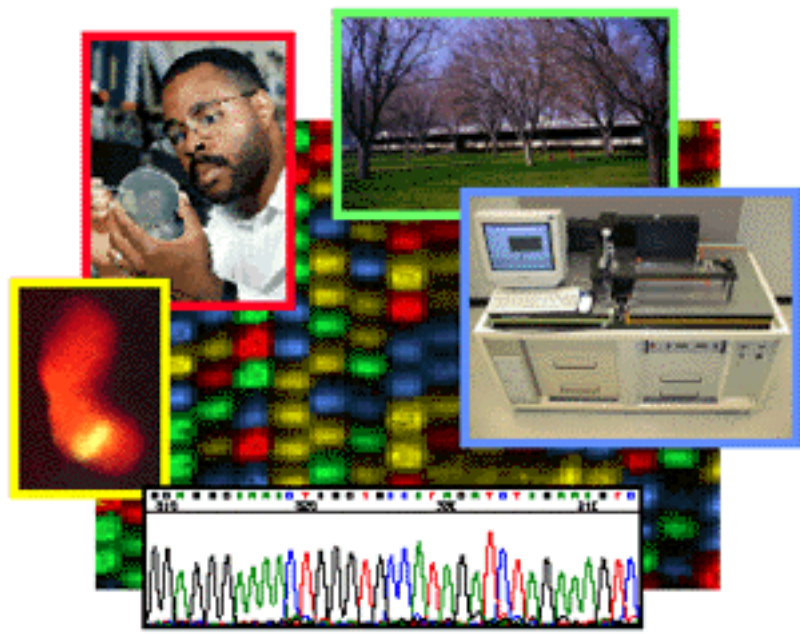
- Develop next generation climate models with improved regional resolution
- Test and improve models using data from the 3 ARM sites
- Collect data to understand the interdependence of climate and the carbon cycle and the impacts on carbon sequestration
- FY 2000 accomplishments
  - *ARM scientists provided new data on how clouds and other atmospheric properties affect the radiation budget*
  - *AmeriFlux scientists determined the relationship between carbon sequestration and temperature, land use, vegetation type, and soil*



The DOE Human Genome Program

- $90 Million in FY 2001
- The Joint Genome Institute (JGI) Production Sequencing Factory begins final stage of completing sequence of human chromosomes 5, 16, 19
  - *100 million subunits of finished DNA sequence*
  - *250 million subunits of high quality draft sequence*
- FY 2000 Accomplishments
  - *Draft sequences of human chromosomes 5, 16, 19 completed*
  - *Entered to public databases*
    - 10 mil subunits of finished DNA sequence
    - 70 mil subunits of high quality draft sequence

JGI
JOINT GENOME INSTITUTE



Science Education and Outreach

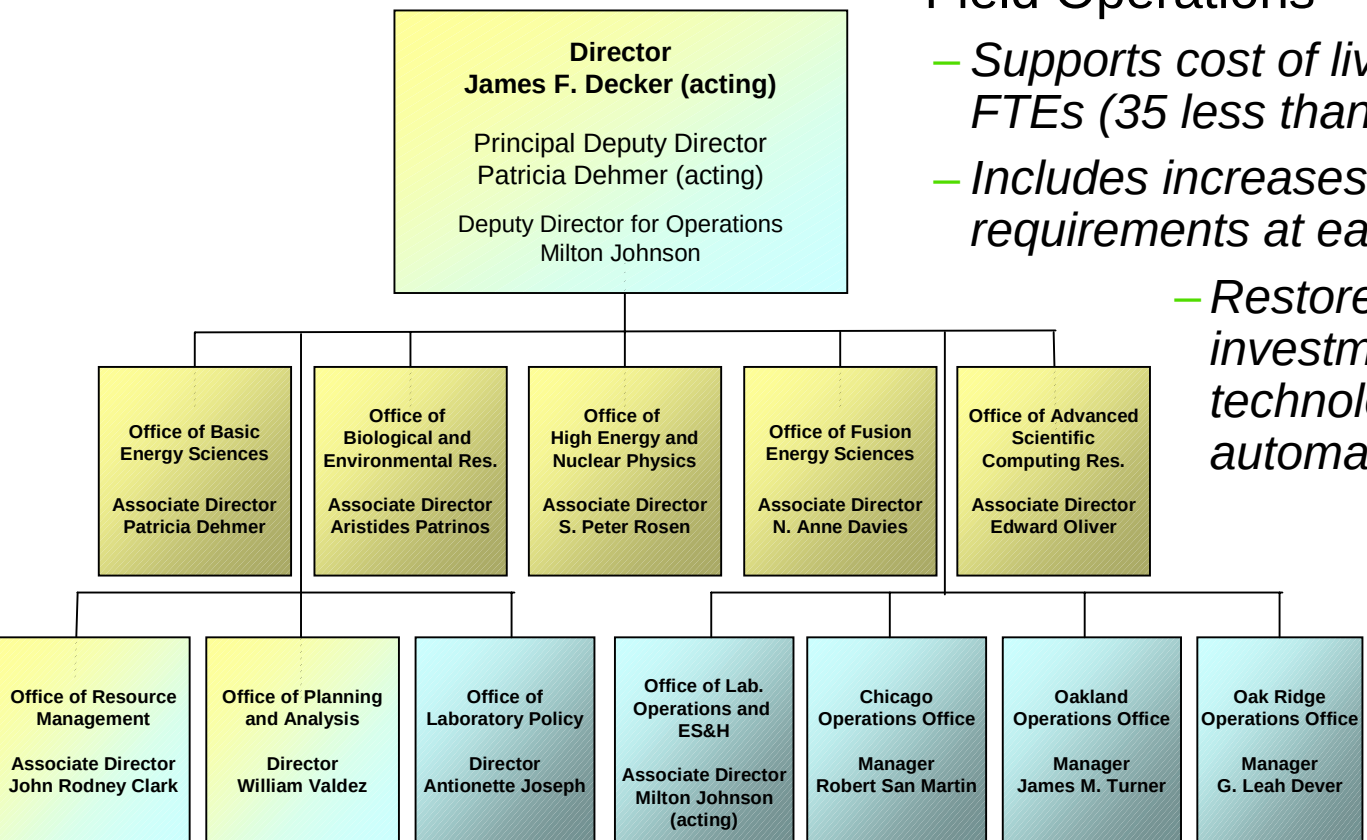
Training the Next Generation of Scientists

EPSCoR
Experimental Program to Stimulate Competitive Research

- $9.5 Million in FY 2001
  - *$6.5 Million core program in Science Program Direction*
    - Undergraduate Research Fellowships Program
    - Community College Initiative
    - National Science Bowl
    - Albert Einstein Distinguished Educator Fellowship
  - *$3.0 Million in EPSCoR*
    - Provide funding to universities to develop scientific manpower through collaborative activities between faculty and students in EPSCoR states and staff in the SC laboratories.
    - Faculty and student teams from EPSCoR states will engage in hands-on research in national laboratories. Workshops and discussions are ongoing with representative scientists from EPSCoR states to acquaint them with the facilities and personnel at the DOE laboratories.
- $2.0 million in FY 2001 for Federal Worker Training and Retention

Program Direction

- Provides for 21 additional FTEs
  - *5 for the Spallation Neutron Source Project*
  - *6 for Waste Management activities transferred from EM to SC*
  - *10 for Scientific and technical Workforce Retention and Recruitment efforts*



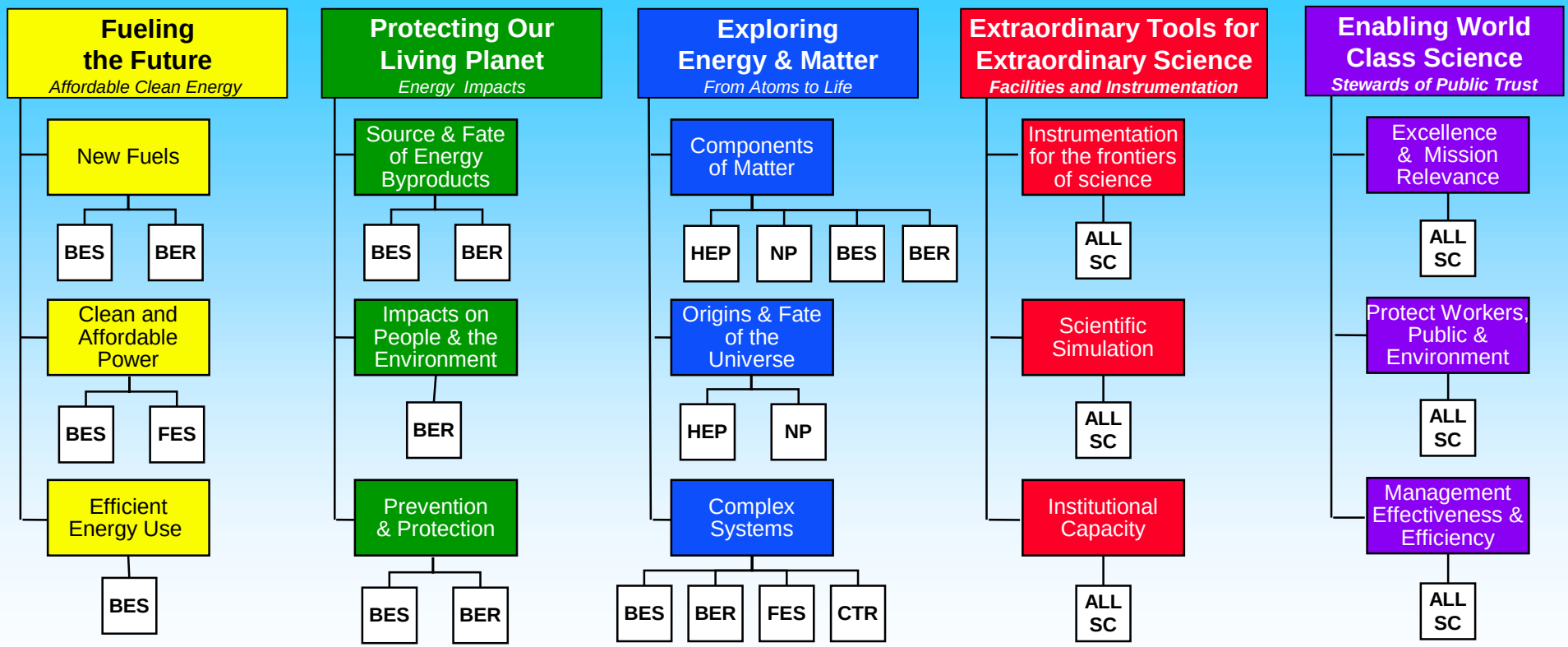
- Field Operations
  - *Supports cost of living adjustments for 732 FTEs (35 less than FY 2000)*
  - *Includes increases for infrastructure requirements at each operations office*
    - *Restores funding for investments in information technology, architecture, and automation activities*

DOE Science Strategic Plan and R&D Portfolio Framework

Office of Science Themes Development

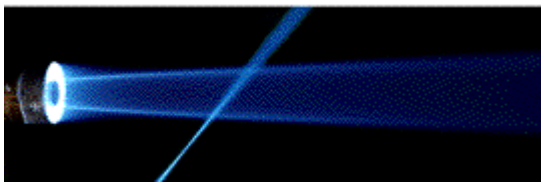
Office of Science Strategic Plan

Science Portfolio Framework



The Office of Science Portfolio

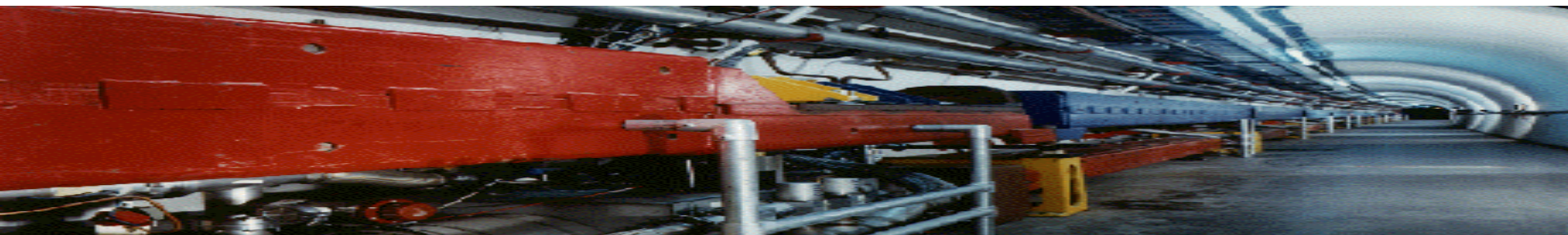
Science for America's Future



- *Fueling the Future*

- *Protecting Our Living Planet*

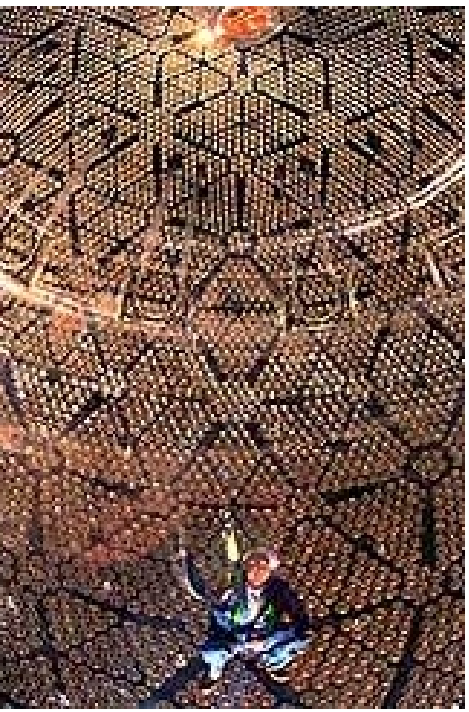
- *Exploring Energy and Matter*
- *Extraordinary Tools for Extraordinary Science*



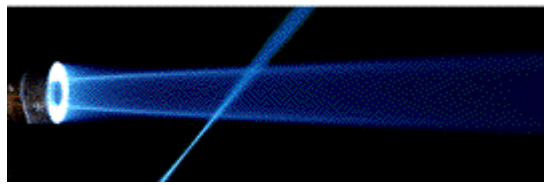
Office of Science

FY 2001 Budget and Program Priorities

Exploring Energy & Matter



Fueling the Future



- Nanoscale Science, Engineering, and Technology
- High-Performance Computing for Science in the 21st Century
- Understanding the Microbial Cell
- Biomedical Engineering
- Carbon Management Science
- Robotics and Intelligent Machines
- The New Frontier of Physics
- Global Climate Research Program
- Human and Microbial Genomes

Protecting Our Living Planet

Office of Science
FY 2001 Budget and Program Priorities

Extraordinary Tools for Extraordinary Science

- The Spallation Neutron Source
- The Large Hadron Collider
- Facility Upgrades and Increased Utilization of the Scientific User Facilities
- Enhanced Computational Capabilities